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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/644,634	08/23/2000	Kanu G. Shah	60680-1407	1464

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EXAMINER	
BISSETT, MELANIE D	
ART UNIT	PAPER NUMBER

1711

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/644,634	SHAH ET AL.
Examiner	Art Unit	
Melanie D. Bissett	1711	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 23 October 2002.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-59 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) 39-45 is/are allowed.

6) Claim(s) 1-38,46,47,49,50,53,54,56 and 57 is/are rejected.

7) Claim(s) 48,51,52,55,58 and 59 is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.

2. Certified copies of the priority documents have been received in Application No. _____.

3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4-5.

4) Interview Summary (PTO-413) Paper No(s). _____.

5) Notice of Informal Patent Application (PTO-152)

6) Other: _____.

DETAILED ACTION

1. The rejections based on 35 USC 102 over Ying et al. and Sasaki et al. have been maintained. However, a new rejection has been made for the claims 46-47 and 49-50 as necessitated by amendment. Additionally, the rejections using Shustack '391 as a secondary reference have been withdrawn. New rejections based on 35 USC 103 have been added. The double patenting rejection has been maintained.

Response to Amendment

2. The amendment filed 10/23/02 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

3. Claim 46 has been amended to limit the adhesion promoter to "non-silicon based" adhesion promoter. The specification does not provide support for excluding silicon based adhesion promoters. Although the specification suggests the use of adhesion promoters which are not silicone based, no teaching of the use or avoidance of such silicon-based adhesion promoters is given. See MPEP 2173.05(i).

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 102

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

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5. Claims 1, 3, 5-11, 14-17, 22-30, and 33-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Ying et al.

6. From a prior Office action:

10. Ying discloses a protective coating for separators in electrochemical cells, where a protective coating is applied to a microporous layer (abstract). The coating may be coated and cured by heat, UV light, visible light, infrared radiation, and electron beam radiation (col. 7 lines 48-55), and the separators may be used in fuel cell applications (col. 11 lines 9-15). Ying teaches combining an ethoxylated diacrylate with a urethane acrylate and a photosensitizer, coating the mixture at a thickness of 4 microns onto a substrate, and exposing the coating to UV lamps for 30 seconds to cure (example 1). Since the microporous layers are thin layers of metal oxide material (col. 19 lines 6-17), it is the examiner's position that the microporous layers of Ying's invention would read on a "plate". Further, since the separators of the invention are useful in fuel cell applications, it is the examiner's position that Ying's reference teaches fuel cell plates and processes of making.

7. Claims 1, 9-13, and 22-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Sasaki et al.

8. From a prior Office action:

12. Sasaki discloses sealants for fuel cells which are applied to a porous carbon plate (col. 3 lines 28-32) and heated to cure the sealant layer (embodiment 1). The plates are exposed to radiation for less than 15 seconds, since radiation is not used to cure the sealant layers. Embodiment 1 shows a coating thickness of 0.25 mm (250 μ m), thus teaching a coating precursor of *less than about 250 μ m*.

9. Claims 46-47 are rejected under 35 U.S.C. 102(b) as being anticipated by Shustack '387.

10. Shustack discloses ultraviolet radiation-curable coating precursor compositions comprising 15-75% by weight of a bulky monomer, a urethane (meth)acrylate oligomer, an epoxy (meth)acrylate oligomer, and about 0.3-10% by weight of an acidic adhesion promoter (col. 2 lines 24-47). A preferred bulky

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monomer is mono-functional isobornyl acrylate (col. 5 lines 58-62), and several aliphatic acrylated urethane oligomers are noted for use in the invention (col. 6 line 29-col. 7 line 16). Multi-functional monomers such as multi-functional (meth)acrylates can be included (col. 10 lines 45-53). Photoinitiators are added when UV-curing is desired in an amount of 0.3-10% by weight of the coating composition (col. 9 lines 18-30).

Claim Rejections - 35 USC § 103

11. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

12. Claims 2-4, 6, 14, 17-21, 24-25, and 28-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasaki et al. in view of Boldt.

13. From a prior Office action:

17. Sasaki applies as above for the coated fuel cell plate and process of coating a fuel cell plate. However, the reference does not teach the applicant's claimed steps of screen printing and exposing the plate to at least two different wavelengths. Boldt teaches a method and composition for coating a gasket with a composition for providing improved sealing characteristics and storage life (col. 4 lines 37-44; col. 2 lines 19-24), where the coatings are screen printed (col. 1 lines 41-48) and exposed to two different ultraviolet wavelengths (col. 1 lines 63-66). Examples show a total cure time of 1.5 seconds (example 1). One coating composition comprises a urethane acrylic oligomer (acrylated oligomer), isobornyl acrylate monomer (mono-functional monomer), TMPEOTA (multi-functional monomer), polydimethylsiloxane (air-release agent), and a benzophenone/1-phenyl-1-2-hydroxy-2-methyl-1-propanone photoinitiator blend (example 5). Coating thicknesses are between 0.001 and 0.020 inches (~25-500 μ m, col. 9 lines 1-6). Therefore, it is the examiner's position that it would have been *prima facie* obvious to use the gasket coating in Sasaki's invention to improve the sealing characteristics of the fuel cell plate.

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14. Additionally, the reference suggests that the curing process causes the coating to adhere to the substrate (col. 8 lines 18-33). Therefore, any additive necessary to the cure process, such as the photoinitiators used in Boldt's invention, would serve to promote adhesion in the coating.

15. Claims 53-54 and 56-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shustack '391.

16. From a prior Office action:

24. The reference teaches a broad range of oligomer weight composition, dependent on the desired extensibility and abrasion resistance properties (col. 6 lines 11-33). However, the reference does not teach the applicant's specific claimed weight ratios of the components. It is the examiner's position that it would have been *prima facie* obvious to use the components in the applicant's claimed ranges to optimize the extensibility and abrasion resistance of the coatings.

25. The reference does not specifically point to a photoinitiator blend of 1-phenyl-2-hydroxy-2-methyl-1-propanone and benzophenone. However, Shustack teaches that cleavage type photoinitiators such as hydroxymethylphenylpropanone and hydrogen abstraction-type photoinitiators such as benzophenone can be used in the invention (col. 9 line 64-col. 10 line 14), where a combination of cleavage-type and hydrogen abstraction-type photoinitiators are used to optimize surface and through cures (col. 10 lines 34-37). Thus, it would have been *prima facie* obvious to choose a blend of hydroxymethylphenylpropanone and benzophenone for photoinitiators to sufficiently optimize the surface and through curing of the coatings.

17. Claims 53-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shustack '387.

18. The reference teaches a broad range of oligomer weight composition, dependent on the desired extensibility and abrasion resistance properties (col. 6 lines 1-28). However, the reference does not teach the applicant's specific claimed weight ratios of the components. It is the examiner's position that it would have been *prima facie*

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obvious to use the components in the applicant's claimed ranges to optimize the extensibility and abrasion resistance of the coatings.

19. Claims 49-50 and 56-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shustack '387 in view of Shustack '391.

20. Shustack '387 applies as above, noting the use of vinylic compounds such as acrylamide, vinyl pyrrolidone and other multi-functional (meth)acrylates (col. 10 lines 45-53), but failing to specify glycerol propoxy triacrylate as a multi-functional monomer. Shustack '391 teaches a similar curable coating incorporating multi-functional monomers, where the same compounds are mentioned (col. 12 lines 11-21). Additionally, Shustack '391 specifies glycerol propoxy triacrylate as a multi-functional acrylate equivalent to acrylamide or vinyl pyrrolidone in function. It is known in the art that multi-functional monomers provide cure ability in coating compositions, where curing improves cohesive strength. Because of the similarity of compositions and function, it is the examiner's position that it would have been *prima facie* obvious to include the multi-functional acrylate specified in Shustack '391 in the coating of Shustack '387 to provide a coating having equally improved cure ability and cohesive strength.

21. Furthermore, Shustack '387 does not specifically point to a photoinitiator blend of 1-phenyl-2-hydroxy-2-methyl-1-propanone and benzophenone, although benzophenone and hydroxy methyl phenyl propanone are both mentioned (col. 9 lines 18-30). Shustack '391 teaches that cleavage type photoinitiators such as

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hydroxymethylphenylpropanone and hydrogen abstraction-type photoinitiators such as benzophenone can be used in the invention (col. 9 line 64-col. 10 line 14), where a combination of cleavage-type and hydrogen abstraction-type photoinitiators are used to optimize surface and through cures (col. 10 lines 34-37). Thus, it would have been *prima facie* obvious to choose a blend of hydroxymethylphenylpropanone and benzophenone for photoinitiators to sufficiently optimize the surface and through curing of the coatings of Shustack '387.

Double Patenting

22. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

23. Claims 1-2, 5-9 and 14-16 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting over claims 1-4 of copending Application No. 09/708,965 in view of Ying et al. Although the conflicting claims are not identical, they are not patentably distinct from each other because:

24. From a prior Office action:

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28. Copending claim 1 discloses a process for sealing and insulating a fuel cell plate comprising providing a fuel cell plate and applying an infrared radiation- or heat-polymerizable coating precursor to a surface of the plate, and exposing the coating precursor to radiation or heat to initiate polymerization or crosslinking. However, the present claim does not specify infrared radiation or note the crosslinking of polymers; thus, it is broader than the copending claim. First, it is the examiner's position that crosslinking is a form of polymerization and thus would be encompassed by the term "polymerization". Secondly, Ying et al. applies as a reference teaching curable (polymerizable) coatings for fuel cell applications, where ultraviolet light, visible light, curable (polymerizable) coatings for fuel cell applications, where ultraviolet light, visible light, infrared radiation, and electron beam radiation are noted as equally beneficial energy sources for curing. Therefore, it is the examiner's position that it would have been *prima facie* obvious to choose polymers curable by other radiation means and to expose the polymers to other radiation sources in the expectancy of equally beneficial results. Copending claims 2-4 parallel present claims 2 and 9.

Allowable Subject Matter

25. Claims 39-45 are allowed.
26. Claims 48, 51-52, 55, and 58-59 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
27. The closest prior art, Boldt (USPN 5,667,227-A), teaches a coating composition comprising a UV-curable coating for a gasket comprising a urethane acrylic oligomer, isobornyl acrylate monomer, a multi-functional monomer, a polydimethylsiloxane air release agent, and a benzophenone/1-phenyl-1-2-hydroxy-2-methyl-1-propanone photoinitiator blend. However, the reference does not teach the use of both aliphatic acrylated urethane oligomers and epoxy acrylate oligomers or the use of adhesion promoters such as methacrylated polyols. It is the examiner's position, therefore, that the combination of methacrylated polyol adhesion promoters with the applicant's claimed coating precursor components would provide a novel, unobvious step over the

prior art. It is also the examiner's position that the combination of aliphatic acrylated urethane oligomers and epoxy acrylate oligomers in a coating on a fuel cell plate would provide a novel, unobvious step over the prior art.

28. Also, Shustack (USPN 5,128,387-A) teaches ultraviolet radiation-curable coating precursor compositions comprising 15-75% by weight of a bulky monomer, a urethane (meth)acrylate oligomer, an epoxy (meth)acrylate oligomer, and about 0.3-10% by weight of an acidic adhesion promoter. However, the reference does not teach the use of an air-release agent including polydimethyl siloxane in the metal container coating. It is the examiner's position that the use of such an air release additive in the applicant's claimed coating composition would be novel and unobvious over the closest prior art.

Response to Arguments

29. In response to the applicant's arguments that Ying does not teach a plate structure analogous to the applicant's claimed plate structure, it is noted that the claims only limit the structure by containing a fuel cell plate and a coating. Although the structure of Ying's teaching may not match the articles of the applicant's specification, the structural differences noted by the applicant in the arguments are not described in the present claims. In the broadest interpretation of the claim, it is the examiner's position that Ying's formation of a microporous electrolyte element having a protective coating layer reads on the applicant's claimed process.

30. Regarding the applicant's arguments that Ying does not teach a "plate", it is noted that the dried coating layers of Ying's invention, formed on a substrate, provide a free standing separator (col. 19 lines 47-67). The use of separator "plates" having a

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porous nature in fuel cell articles is recognized in the art. See Sasaki, col. 3 lines 15-32; col. 4 lines 19-42. Thus, Ying teaches coating a plate to be used in a fuel cell.

31. In response to the applicant's arguments that Sasaki does not teach a plate structure analogous to the applicant's claimed plate structure, it is noted that the claims only limit the structure by containing a fuel cell plate and a coating. Although the structure of Sasaki's teaching may not match the articles of the applicant's specification, the structural differences noted by the applicant in the arguments are not described in the present claims. In the broadest interpretation of the claim, it is the examiner's position that Sasaki's formation of a gasket seal coating on a porous carbon plate to be used in fuel cell applications reads on the applicant's claimed process.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie D. Bissett whose telephone number is (703) 308-6539. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (703) 308-2462. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

mdb
January 2, 2003



James J. Seidleck
Supervisory Patent Examiner
Technology Center 1700